

**REMARKS**

Claims 1-18 are pending.

Claims 1-18 stand rejected.

Claim 1 has been amended

Claims 1-18 are hereby submitted for review and consideration.

No new matter has been added.

In the Office Action, the Examiner has rejected claims 1-18 under 35 U.S.C. § 112 because independent claim 1 is vague and indefinite.

Claim 1 is defined by three principal elements 1) a transmission element; 2) a flammable element; and 3) a flame retardant coating layer surrounding the flammable element. The amendments to claim 1 are to clarify the scope of the third element.

The flame retardant coating is formed of a particular composition and must include a polymer. For example, as described in lines 12- 18 of page 9 of the specification as filed, the flame retardant composition may either be the polymer itself or a polymer impregnated into a tape.

Claim 1 further includes the limitation that the polymer that forms at least part of the flame retardant coating is formed from a polymerizable liquid composition that includes the polymer precursors. Those precursors include functional groups selected from any one of acrylates, methacrylates, epoxies, vinyl ethers, allyl ethers, and oxetanes.

Thus, the precursors that make up the polymer from the flame retardant composition include functional groups. There is no limitation as to what polymer

is eventually formed and hence there is no limitation as to what precursor is used, provided only that the polymer (and precursors) include the claimed functional groups. These precursors may be selected from a number of standard polymer precursor monomers or oligomers.

By way of example, one precursor may be polyester acrylate oligomers such as the one recited in composition 1 on lines 34-36 of page 1 of the specification. Here the precursor is the polyester oligomers and the included functional group is an acrylate group.

Other such precursors may include any polymer precursor oligomer that includes the functional group as called for in claim 1. For example, polyether (meth)acrylate oligomers, urethane (meth)acrylate oligomer, epoxy-(meth)acrylate oligomer, (meth)acrylate-functional monomers, aliphatic epoxy resins, bisphenol diglcidyl ether epoxy resins, biscycloaliphatic epoxy resins, allyl glycidyl ether monomers, vinyl ether monomers and oligomers, oxetane-functional monomers and oligomers, may all be precursors used in claim 1, as each includes the required functional group.

The final element of the claim is that the polymerizable liquid composition that eventually forms the polymer of the flame retardant composition also, in addition to including precursors with the above described functional groups, includes at least one phosphorous group.

Thus, although the polymer itself is not called for, the specific functional group requirements that must be found in the precursor (functionalized oligomers or monomers) as well as the phosphorus group that must be included in the

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polymerizable liquid is clearly defined by the claim. One of ordinary skill in the art of polymers would be able to discern the scope of the claimed material.

In view of the forgoing, Applicant respectfully submits that amended claim 1 is not vague and requests that the rejection under 35 U.S.C. § 112 be withdrawn. Furthermore, as claims 2-18 depend therefrom, the rejection of these claims should be withdrawn for the same reason.

Turning now to the substantive rejections, the Examiner has rejected independent claim 1 under 35 U.S.C. § 103 as being unpatentable over Hasegawa et al. (U.S. Patent No. 6,755,995) in view of Hall (U.S. Patent No. 6,025,422).

Applicant respectfully disagrees with the Examiner's rejection and submits the following remarks in response.

The present invention as claimed in independent claim 1 is directed to a flame-retardant cable having a transmission element a flammable element and a flame-retardant coating layer of cross-linkable resin surrounding said flammable element. The flame-retardant layer includes a polymer obtained from a polymerizable liquid composition. The polymerizable liquid composition contains at least a precursor for said polymer, where the precursor including functional groups selected from any one of acrylates, methacrylates, epoxies, vinyl ethers, allyl ethers, and oxetanes. The polymerizable liquid composition also includes at least one phosphorous group.

The composition of the present invention provides advantages over prior art flame retardant cables. For example, the polymerizable liquid composition

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including functional groups of acrylates, methacrylates, epoxies, vinyl ethers, allyl ethers, and oxetanes generates functional cross-linkable resins applied to the surface of cables by dipping, spraying or brushing.

These polymerizable functional resins present good mechanical properties, in particular good elasticity (high breaking elongation), and also improved hardness.

Additionally, the inclusion of the phosphorus group in the polymerizable liquid composition allows the phosphorus to be incorporated as a functional group of the polymer. This provides added stability to the phosphorus in the flame retardant material.

The cited prior art, namely Hasegawa discloses a halogen free flame retardant resin composition. However, the resin referred to throughout is thermoplastic, such as polyethylene (PE), not a functional cross-linkable resin. For example, see column 2, lines 41-54. This coating of Hasagawa is configured to provide a modified insulator that has improved fire resistance equal to PVC.

Hasegawa does not teach a flame retardant layer disposed over flammable layer. Rather Hasegawa teaches an improved thermoplastic insulator (PE). This is akin to an improvement of the *flammable layer* of the present invention which may in-fact be a PE insulator. As such, there is not second flame retardant layer in Hasegawa.

Second, the Hasagawa reference simply teaches a *thermopolymer*, such as a PE or other similar polyolefines, but does not disclose a functional cross-linkable resin formed from a polymer having the specific function groups in the

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precursors as recited in the claim.

Also, although phosphorus (red phosphorus) is used as an auxiliary flame-retardant it is simply included into the composition. It is not included however as a functional group of the polymer. See column 4, lines 29-38 of Hasegawa. This phosphorus is simply included in the composition without chemical reaction with the polymer, unlike the present invention that includes a phosphorous group directly in the polymer by way of its inclusion in the polymerizable liquid composition.

The Hall reference cited by the Examiner is directed to flame retardant polymer compositions. However, there is nothing in hall regarding cross-linkable resin as taught by the present invention, nor is there a teaching to include phosphorus as a functional group of a polymer.

As such, applicant respectfully submits that the cited prior art, either alone or in combination with one another do not teach or suggest the present invention as claimed. For example, there is no teaching or suggestion in either Hasegawa or Hall that discloses a flame-retardant coating layer of cross-linkable resin surrounding a flammable element where the polymer of the flame-retardant layer is derived from a polymerizable liquid composition, that maintains a precursor including functional groups selected from any one of acrylates, methacrylates, epoxies, vinyl ethers, allyl ethers, and oxetanes.

Furthermore, there is no teaching or suggestion in either Hasegawa or Hall that discloses a polymerizable liquid composition also includes at least one phosphorous group.

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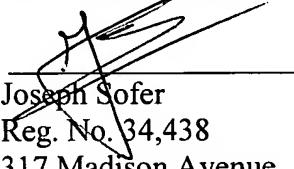
Applicant respectfully requests that the rejection of independent claim 1 be withdrawn. Also, as claims 2-18 depend therefrom, Applicant requests that the rejection of these claims be withdrawn as well for the same reason.

In view of the forgoing, Applicants respectfully submit that the present invention as claimed is now in condition for allowance, the earliest possible notice of which is earnestly solicited. If the Examiner feels that a telephone interview would advance the prosecution of this application she is invited to contact the undersigned at the number listed below.

Respectfully submitted

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Dated: 6/21/05

By: 

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